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ABSTRACT

In the 1980s the outmigration from rural areas of young and well educated adults was prompted by the decline of rural industries and the resultant economic stress. This paper examines the issue of selective migration during the 1980s by comparing young people who left their hometown to those who stayed behind. Longitudinal survey data collected in the High School and Beyond datafile (1980-86) are used to analyze the individual and community level factors affecting the probability of migration from a hometown. Of the rural youth who were seniors in 1980, 40% had moved at least 50 miles from their hometown by 1986 and had gained advantages in education, income, and occupational status. Comparison of data between these migrants and those who did not migrate indicate that migrants: (1) continued their formal education at a higher rate than nonmigrants (77% compared to 54%), with 30% completing a four-year college program (compared to 10% of nonmigrants); (2) held professional or managerial jobs at a higher rate than nonmigrants (38% compared to 15%); (3) earned about 10% more than nonmigrants; (4) came from homes with better educated parents (64% compared to 46%); (5) had taken college preparatory classes (45% compared to 23%), and (6) had taken either the SAT or ACT (73% compared to 45%). Separate logistic regression analysis of community factors indicate: (1) youth in the rural Midwest and West are more likely to migrate than those in the South and Northeast; (2) higher average per capita income in the home county decreased the probability of migration; (3) higher high school expenditures per student increased migration probability; and (4) the greater the distance of the nearest four-year college, the more probable was eventual migration. Includes 17 references and 12 data tables. (ALL)

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Selective Migration of Rural High School Seniors in the 1980s

by
Kelvin Pollard,
William P. O'Hare, and
Ruth Berg

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SUMMARY

During the 1980s, many industries important to rural America declined simultaneously, turning what normally would have been a regional problem into a national one. This situation resulted in the out-migration of many rural adults, particularly the young and well-educated, from rural areas.

The rural exodus of the past decade illustrates the fact that migration is not a random occurrence. Instead, it is a self-selective process based on certain characteristics, such as age, education, and level of economic development in a community.

This paper examines the experiences of rural youth in the early and mid-1980s by using the High School and Beyond student data file, a longitudinal survey conducted by the National Center for Educational Statistics (NCES) of the U.S. Department of Education. The report analyzes data from 9,373 seniors (2,637 of whom attended rural schools) who participated in the 1980, 1982, 1984, and 1986 panel waves and addresses two issues: (1) differences in socioeconomic outcomes between rural migrants and nonmigrants and (2) the differences between the two groups by their senior year of high school. In addition, the student file was merged with similar NCES data files of school characteristics and economic indicators to form a contextual data file. Through this combined data set, we analyzed the individual- and community-level factors affecting the probability of migrating from one's hometown.

Forty percent of rural youth who were seniors in 1980 had moved at least 50 miles from their home communities by 1986, compared with only 27 percent of seniors who attended metropolitan schools. Also by 1986, the rural seniors who migrated had attained advantages in education, income, and occupational status than rural seniors who stayed behind.

- Three-fourths (77 percent) of all rural seniors moving far from of their hometowns continued their formal education after high school, compared with just over half (54 percent) of those who stayed behind. Moreover, 30 percent of migrants had completed a four-year college program by 1986, compared with only 10 percent of nonmigrants.
- The rural migrants had slightly higher incomes and earnings than those who stayed behind. For example, the mean 1985 income for nonmigrants was 90 percent that of migrants ($16,200 to $17,992). Because of the higher education levels of migrants, we expect the income differences to increase as these youth move further in their careers.
- More than a third (38 percent) of migrants held professional or managerial jobs in 1986, compared with less than a fifth (15 percent) of nonmigrants. By contrast, rural seniors remaining near their hometowns were more likely than those who moved to be operatives, laborers, and service workers. Part, but not all, of the occupational differences between migrants and nonmigrants are due to the greater education of migrants.

The high-school experiences of rural seniors of 1980 suggest that seniors who had left their hometowns by 1986 came from homes with better educated parents, were more likely to enroll in college preparatory classes,

and scored higher on tests measuring cognitive skills.

- Nearly two-thirds (64 percent) of the rural seniors who eventually left their hometowns had at least one parent with some formal education after high school, compared with less than half (46 percent) of those who stayed.
- Nearly half (45 percent) the migrants were enrolled in an academic (college preparatory) program, nearly double the percentage for nonmigrants (23 percent). In addition, a greater percentage of rural migrants than of nonmigrants had taken a variety of advanced mathematics and science courses.
- Rural seniors who migrated were more likely to have taken the SAT or ACT than nonmigrants–73 to 45 percent. Migrants also tended to score higher than nonmigrants on a battery of tests measuring cognitive abilities.

A separate analysis on what affects the probability of migrating 50 miles from one's hometown found that community factors also played an important role in rural out-migration.

- Youth in the rural Midwest and West were more likely to move than those in the South and Northeast.
- As a community's per capita income increased, the likelihood of migration of a rural youth out of that community decreased.
- On the other hand, increases in a community's per pupil high-school expenditures increased the probability of out-migration among rural youth.
- The further a rural youth lived from the nearest four-year college, the more likely s/he was to move from the hometown.

These results suggest that continued out-migration of young people from rural areas will have serious consequences for nonmetropolitan communities. The loss of young, well-educated adults will hamper economic development strategies designed to revitalize rural America.

INTRODUCTION

Background Information

More than any other single factor, economic stress has characterized the rural[1] American experience in the 1980s. Many industries important to rural areas, such as mining, energy, agriculture, and manufacturing, declined simultaneously. This large-scale decline turned what could have been a regional problem into a national one. Nonmetropolitan communities have had a particularly difficult time recovering from these downturns, as many have been economically dependent on one industry. Such a reliance on a single economic base has made them vulnerable to industry-specific recessions (see U.S. Department of Agriculture 1987; O'Hare and Pauti 1990). The results of these developments have been increased unemployment and underemployment, declining incomes, and greater poverty—all of which have increased the economic gap between rural and urban Americans (see O'Hare 1987; O'Hare and Pauti 1990).

The overall economic decline has caused many rural adults to migrate to urban areas. Between 1970 and 1980, rural areas gained, on average, 350,000 people a year through net migration. As the 1980s progressed, however, these areas experienced increasing net out-migration—to the point that between 1986 and 1987, 952,000 more people *left* rural communities than moved to them (O'Hare 1988). Moreover, 1,160 rural counties lost population between 1983 and 1985—three times the number of counties experiencing such declines during the 1970s and nearly half of the 2,443 counties classified as nonmetropolitan by the Census Bureau[2] (U.S. Department of Agriculture 1987).

The economic crisis in rural America had a particularly devastating effect among its youth. Although the nonmetropolitan exodus of recent years has cut across age, ethnic, marital, and educational lines, the well-educated and the young have been most likely to leave.[3] For example, over half of the people leaving rural areas between 1986 and 1987 had at least a year of college; over a quarter (27 percent) had at least four or more years of higher education. Nearly a third of all rural out-migrants during 1986-87 were between 18 and 24 years of age (O'Hare 1988). These statistics illustrate the selectivity of the migration process. Migrants are not a random sample from the general population; rather, certain characteristics increase the probability of moving. As early as the late 19th century, E.G. Ravenstein (see Lee 1966)

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[1] In this paper, we use the terms "rural" and "nonmetropolitan" interchangeably.

[2] The Census Bureau defines a nonmetropolitan county as any county not in a Metropolitan Statistical Area (MSA). An MSA consists of a central city, the county containing the central city, and all suburban counties with close economic ties to the central city.

[3] The migration of young people out of rural areas is not a new phenomenom. Census Bureau migration figures show that for both the 1965-1970 *and* 1975-1980 periods, more adults between 20 and 29 moved *out* of nonmetropolitan areas than moved into them (Fuguitt, Brown, and Beale 1989).

alluded to some form of migrant self-selection when, in his *Laws of Migration*, he stated that people in rural areas had a greater propensity to migrate than people in urban areas. More recent research has been more direct. According to many scholars, migrants evaluate a given set of factors differently than nonmigrants do (see Lee 1966; Speare, Goldstein, and Frey 1975; Bogue 1977; Rothenberg 1977).

Several individual-level characteristics seem to factor heavily in the migration decision. For example, Lee (1966) pointed out the tendency of people to change residences at certain stages of the life cycle (such as labor force entry and marriage). In addition, Larry Long (1973), looking at migration patterns among men in the late 1960s and early 1970s, found education and, to a lesser extent, occupational status to be associated with inter-county and inter-state migration. Well-educated salaried professionals and managers were the most likely to migrate. Education and occupational status were particularly significant factors among men aged 25 to 29. More recent studies have also found that migrants had different educational levels than nonmigrants (see Bouvier, Macisco, and Zarate 1976; Wilson 1988).

But such individual-level characteristics are not the only factors that influence migration. Community circumstances also affect the decision to move or to stay. The relative level of economic development at both origin and destination helps determine who is most likely to migrate. Past studies suggest a link between the comparative origin/destination development levels and educational differences between migrants and nonmigrants (see Bouvier, Macisco, and Zarate 1976; Wilson 1988).

This paper examines the issue of selective migration in light of rural America's economic crisis during the 1980s. Young people who migrated from their hometowns are compared with those who stayed behind, using longitudinal survey data from 1980 to 1986. We study the post-migration outcomes of these two groups, as well as their comparative experiences before the migrants ultimately left. We also analyze migration in a community context, analyzing which aggregate-level factors influence the decision to move.

The "High School and Beyond" Datafiles

The High School and Beyond (HS&B) student datafile follows a nationally representative sample of over 11,000 respondents who were high school seniors in 1980. The National Center for Educational Statistics (NCES) of the U.S. Department of Education conducted the initial 1980 survey, as well as follow-up studies in 1982, 1984, and 1986. The datafile contains individual and family background data for 1980 and many demographic and socioeconomic measures for each subsequent survey year. Despite some attrition from the initial sample, weights have been appropriately recalculated to accurately reflect the national population of over 3 million high school seniors in 1980. Of the total number of survey respondents, 9,373 seniors (2,637 of whom attended rural schools) answered each of the four questionnaires.

In addition to the student questionnaire, the NCES mailed questionnaires to school administrators in 1980 and 1982. This survey asked administrators to report on a number of characteristics of their school, such as the per pupil school expenditure, the racial composition of the faculty, and the average rate of student attendance. These data can be readily matched to the individual senior records, thanks to a high school identification code provided by the NCES.

The NCES also created a labor market indicator datafile using basic economic characteristics collected by the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis (BEA) for the county, Metropolitan Statistical Area (MSA), and state where the schools were located. Using geographic identifiers, the NCES matched the school records to BLS/BEA data on per capita income, unemployment, employment growth, and other characteristics. NCES then removed the geographic identifiers before releasing the datafile. As with the school file, the economic indicators file can be matched to the individual-level HS&B records through the school identification code.

The HS&B data set is extremely useful for migration analysis. The individual-level file, for example, categorizes the respondents by the location of the high schools they attended in 1980—that is, whether the schools were located in nonmetropolitan areas. The contextual file resulting from the merger of the individual records with the school and economic data sets gives HS&B a major advantage over most other available data sets. The contextual file allows an assessment on whether economic conditions and high school characteristics have an effect on the likelihood of leaving one's hometown —after controling for the effects of individual-level characteristics such as gender, race, and the type of high school program the senior followed.

This sample includes only those young people who were high school *seniors* in 1980. To the extent that rural nonmigrants dropped out of high school before their senior year at a higher rate than rural migrants, the results here may underestimate the true differential between rural migrants and nonmigrants during the 1980s.

Methods

We begin our analysis by using the individual-level data for 1986 to examine educational attainment, occupational status, and income and earnings in 1985. Through the statistics derived from this information, we can determine differences in outcomes between rural seniors who had moved at least 50 miles from their home communities by 1986 and those who remained within that 50 mile radius. Use of the 1986 data is helpful for this assessment, as by 1986 most high school seniors in 1980 had completed their formal education and started on careers. We discuss the results later in this paper.

We then address the issue of self-selection among rural migrants—that is, whether or not any differences between migrants and nonmigrants were present by the senior year of high school. The 1980 individual-level data

examining the students' high school experiences, including type of high school program, coursework, College Board tests taken, and scores on cognitive tests, is used.

Finally, we use the data from the contextual file to analyze the factors influencing the likelihood that a rural senior migrated from his/her hometown after high school. We will use a regression model in the analysis, incorporating individual- and community-level factors.

RURAL SENIORS: THE MIGRANTS AND THE NONMIGRANTS

Economic conditions in rural America during the 1980s deteriorated to the point where a significant number of adults left rural communities (O'Hare 1988). Young adults in particular felt the lack of opportunities that fueled the rural exodus. Between 1979 and 1987, for example, the percentage of young (aged 16-34) rural wage earners employed in low wage jobs[4] increased 11 percentage points, to 57 percent. Moreover, such increases occurred in all sectors of the economy and in virtually every census division of the country (O'Hare and Pauti 1990). Thus, it is not surprising that youth in nonmetro areas were likely to go where their educational, income, and occupational prospects seemed brighter.

Rural youth were less likely than metropolitan youth to have remained near their home communities six years after their senior year. Forty percent of 1980 seniors attending schools in nonmetropolitan areas had moved at least 50 miles from their hometowns six years later, compared to only 27 percent of seniors attending metropolitan high schools. The nonmetropolitan seniors who made such a long-distance move did not necessarily head for metropolitan areas—the HS&B data does not include any indicators to measure this for 1986. But even if rural seniors left for other nonmetropolitan areas, their departure in itself implies three things: few economic opportunities in their hometowns, a lack of faith in their home communities' ability to provide such favorable economic conditions, and a willingness of rural seniors to look elsewhere for these opportunities.

In Tables 1 through 5, we compare the experiences of nonmetropolitan migrants with those of nonmigrants through February 1986 in terms of education, income and earnings, and occupational status. If the migration from rural communities reflects a "brain drain" of young people searching for better opportunities, then we would expect rural migrants to be better educated, have more income, and have better jobs than nonmigrants.

Education

Table 1 shows the educational attainment of 1980 seniors attending nonmetropolitan schools by their migration status in February 1986. Migrants at-

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[4] Low-wage jobs are defined as those that prevent a worker from earning enough to keep a family of four out of poverty, assuming the jobs are full-time and year-round (O'Hare and Pauti 1990).

TABLE 1. Educational Attainment of 1980 Nonmetropolitan Seniors in 1986

Educational attainment	All nonmetropolitan seniors	Migrants	Nonmigrants
High school or less	36%	23%	45%
Some post-secondary education	46	47	44
Bachelor's (4-year) degree or more	18	30	10
Total[a]	100%	100%	100%
(Weighted N, in thousands)[b]	(948)	(375)	(558)

a Subtotal percentages may not sum to 100 due to rounding.
b Weighted N subtotals do not sum to total due to missing data on migration.

SOURCE: High School and Beyond, 1986.

tained more education than nonmigrants. Three-fourths (77 percent) of all nonmetropolitan seniors moving at least 50 miles from their hometowns continued their formal education in some way after high school, compared with just over half (54 percent) of those who stayed behind. Moreover, the ratio of the percentage of migrants who had completed a four-year college program by 1986 to that of nonmigrants who had done the same was three to one (30 percent for migrants, 10 percent for nonmigrants).

Income and Earnings

Table 2 shows the mean 1985 income and earnings of the rural migrants and nonmigrants. Income includes any money coming into the household—including such sources as child support, public assistance, or inheritance. Earnings refer to income from wages, salaries, or self-employment (U.S. Bureau of the Census 1988). Whether we look at income or earnings (including and excluding the spouse's), we find that those who migrated had slightly higher amounts than those who stayed behind. The mean 1985 income for nonmigrants was 90 percent that of migrants ($16,200 to $17,992).

The data in Table 2 reflect only one year's income and compare people at early stages in their careers, when differentials between individuals are small. These differences should increase as the youth move along their career paths. The migrants tend to have more education, as shown in Table 1, and more education often means higher income.

Table 3 illustrates this point. Analyzing year-round, full-time workers, the table shows that for both men and women, average expected lifetime earnings (defined as earnings expected between ages 18 and 64) increase for the more educated. For example, men attaining 16 years of education (the equivalent of a four-year college degree) can expect, on average, to earn 34 percent more over their lifetimes than men with only 12 years of schooling—

TABLE 2. 1985 Mean Income and Earnings of 1980 Nonmetropolitan Seniors

	Migrants	Nonmigrants	Nonmigrant as % of migrant
Income (including spouse's)	$17,992	$16,200	90
Earnings			
including spouse's	$16,646	$15,927	96
excluding spouse's	$11,105	$10,474	94

NOTE: The HS&B dataset allowed for the separation of earnings of individuals from those of their spouses, which enabled the calculation of mean earnings both including and excluding the spouse's earnings. The dataset, however, did not permit such separation of total income; therefore, all calculations of mean income include any spousal income.

SOURCE: High School and Beyond, 1986.

TABLE 3. Short-term and Lifetime Earnings Expected in 1979, by Sex and Education
in thousands of 1985 dollars

	Years of school completed				
Earnings[a]	Less than 12	12	13-15	16	17 or more
Men					
Short term (ages 18-23)	66	85	76	56	50
Lifetime (ages 18-64)	999	1,231	1,366	1,646	1,778
Women					
Short term (ages 18-23)	57	66	88	71	48
Lifetime (ages 18-64)	591	750	847	1,001	1,130

a Assuming year-round, full-time work.

SOURCE: U.S. Bureau of the Census. 1983.

approximately $1.65 million to $1.2 million. Similarly, the anticipated lifetime earnings of women with 16 years of schooling are 33 percent higher than those of women with 12 years of education ($1,000,000 to $750,000) (U.S. Bureau of the Census 1983).

The table also shows, however, that for the first few working years, the long-term relationship between earnings and education is not readily apparent. For example, from age 18 through age 23 (which would correspond to the six-year period covered in our study), men attaining a college degree expect to earn $55,600, only 65 percent of the cumulative earnings of men with no more than 12 years of education ($85,200). Similarly, women having 16 years of education can expect to earn less between these ages than women with 13-15 years of schooling (equivalent to some college education without a degree)—$71,000 to $87,500.

These results, which come from 1979 data, show that while education does not necessarily show a high dividend immediately, it ultimately does pay over the course of one's working life. As those going to college complete their education and begin a career, their earnings begin to overtake those of their less educated counterparts. Because, as Table 1 showed, rural migrants had attained more education than nonmigrants, we can reasonably expect their income differentials to expand in future years.

Occupation

Table 4 compares the occupational status in 1986 of nonmetropolitan seniors who left their communities with that of seniors who stayed. The table shows over a third (38 percent) of migrants held professional or managerial jobs in 1986, compared to less than a fifth (15 percent) of nonmigrants. By contrast, rural seniors remaining in or near their hometowns were more likely than those who moved to be operatives and laborers. In 1986, 20 percent of nonmigrants were in these jobs; only 10 percent of the migrants held similar employment. Stayers were also more likely than movers to work in relatively lower paying service occupations—15 to 10 percent. This greater likelihood of those who left than of those who stayed to hold higher status employment suggests greater opportunities for such work away from nonmetropolitan areas. In turn, the relative success of migrants may cause other young people in rural communities to leave their hometowns to seek better jobs in urban areas.

Part, but not all, of the occupational differences between migrants and nonmigrants result from the higher education of migrants. Table 5 looks at the differences in occupational status for migrants and nonmigrants, at all levels of educational attainment. After controling for educational attainment, the patterns found in Table 4 hold. For example, more than a third (36

TABLE 4. Occupational Status of 1980 Nonmetropolitan Seniors in 1986

Occupational category	Migrants	Nonmigrants
Professionals/managers	38%	15%
Sales and clerical workers	23	27
Craftsmen	15	12
Operatives	6	14
Laborers	4	6
Service workers	10	15
Farm workers	0	4
Not working	4	7
Total	100%	100%
(Weighted N, in thousands)	(371)	(550)

SOURCE: High School and Beyond, 1986.

TABLE 5. Occupational Status of 1980 Nonmetropolitan Seniors in 1986, by Education

Occupational category	High school or less		Some post-secondary education		4-year degree or more	
	Migrants	Non-migrants	Migrants	Non-migrants	Migrants	Non-migrants
Professionals/managers	12%	7%	36%	16%	61%	45%
Sales/clerical workers	23	21	26	32	20	25
Craftsmen	27	15	15	10	8	4
Operatives	12	21	5	9	2	8
Laborers	8	9	3	5	1	2
Service workers	10	13	12	18	7	8
Farm workers	0	4	1	5	0	3
Not working	7	9	3	5	2	4
Total[a]	100%	100%	100%	100%	100%	100%
(Weighted N, in thousands)	(85)	(248)	(175)	(245)	(111)	(57)

a Subtotal percentages may not sum to 100 due to rounding.

SOURCE: High School and Beyond, 1986.

percent) of nonmetropolitan seniors who moved and had some post-secondary education (but not a bachelor's degree) held professional and managerial positions. In contrast, less than a fifth (16 percent) of those who remained near their home communities held professional and managerial jobs. In addition, nonmetropolitan seniors who stayed close to home—regardless of education—were more likely to be operatives, laborers, and service workers.

The above data suggest that, as expected, the 1980 rural seniors who left their home communities attained certain advantages over those who stayed. In some cases (such as occupational status), the favorable position of migrants held regardless of educational attainment. These results imply that rural youth migrating from their hometowns did so in search of greater access to educational opportunities elsewhere and the employment opportunities of which well-educated people can take advantage.

THE EDUCATIONAL EXPERIENCES OF RURAL MIGRANTS AND NONMIGRANTS: IS THERE SELF-SELECTION?

The 1980 rural high school seniors who had left the immediate area of their hometowns by 1986 had encountered more advancement in education and socioeconomic status than those who stayed behind. But migration is a selective process; that is, migrants often have different individual characteristics than nonmigrants *before* the move occurs. Age and educational attainment have been among the factors linked to migration selection in past research

(see Lee 1966; Bouvier, Macisco, and Zarate 1976; Wilson 1988; Fuguitt, Brown, and Beale 1989). Therefore, it is likely that eventual migrants enjoyed certain advantages over nonmigrants by their senior year in high school. An analysis of the high school experiences of 1980 rural seniors by their eventual migration status illustrates this self-selection.

Parent's Education

Table 6 shows the highest level of education for parents of the 1980 nonmetropolitan seniors. Parents' education is defined as that of the parent with the higher educational level. We examine this selection factor because well-educated parents are most likely to stress the importance of education, largely by making the investment necessary for their children to achieve at a high level (Blau and Duncan 1967). Parents establishing such a climate motivate their children to attain as much schooling as possible.

Parents of rural migrants tended to be better educated than those of nonmigrants (Table 6). Almost two-thirds (64 percent) of rural seniors who eventually left their hometowns had at least one parent with some formal education after high school, compared to less than half (46 percent) of the seniors who stayed. In addition, the parents of migrants were nearly twice as likely as those of migrants (16 to 9 percent) to have attained at least a bachelor's (four-year) degree.

Curriculum and Coursework

In addition to the educational climate at home, the academic experiences while in school help determine what skills young people eventually take with them to the job market. Tables 7 through 10 provide information on the actual high school experiences of future rural migrants and nonmigrants.

Table 6. Education Level of Parents of 1980 Nonmetropolitan Seniors

Parents' level of education	All nonmetropolitan seniors	Migrants	Nonmigrants
High school or less	46%	36%	54%
Some post-secondary education	42	48	37
4-year degree or more	12	16	9
Total	100%	100%	100%
(Weighted N, in thousands)[a]	(823)	(349)	(460)

a Weighted N subtotals do not sum to total due to missing migration data.

Source: High School and Beyond, 1986.

As seen in Table 7, eventual migrants were more likely to have taken a program preparing them for college. Nearly half (45 percent) of migrants had enrolled in an academic (college preparatory) program. This percentage was nearly double that of nonmigrants taking an academic curriculum (23 percent). Nonmigrants, by contrast, were almost twice as likely as migrants (31 to 17 percent) to have enrolled in a vocational program.

Table 8 shows the mean years of coursework the 1980 rural seniors took between grades 10 and 12 in six subject areas: English, science, mathematics, foreign languages, history and social sciences, and vocational and business courses. Eventual migrants from rural areas, as a group, completed slightly more coursework than nonmigrants in most areas. For example, migrants averaged 2.1 years of mathematics between grades 10 and 12, compared to 1.8 years for nonmigrants. Nonmigrants, on the other hand, had taken more vocational and business coursework than migrants (2.8 to 2.3 years).

TABLE 7. High-School Programs of 1980 Nonmetropolitan Seniors

Program	All nonmetropolitan seniors	Migrants	Nonmigrants
Academic/college prep.	33%	45%	23%
General	43	38	46
Vocational	25	17	31
Total[a]	100%	100%	100%
(Weighted N, in thousands)[b]	(935)	(371)	(549)

a Subtotal percentages may not sum to 100 due to rounding.
b Weighted N subtotals do not sum to total due to missing migration data.

SOURCE: High School and Beyond, 1986.

TABLE 8. Courses Taken by 1980 Nonmetropolitan Seniors, Grades 10-12

Specific course area	All nonmetropolitan seniors	Mean number of years: Migrants	Mean number of years: Nonmigrants
Mathematics	1.9	2.1	1.8
English	2.9	3.0	2.9
Foreign languages	0.7	0.8	0.5
History/social studies	2.3	2.3	2.3
Science	1.7	1.9	1.5
Vocational/business	2.6	2.3	2.8

SOURCE: High School and Beyond, 1986.

Table 9 shows that a greater percentage of future nonmetropolitan migrants than of nonmigrants had taken advanced math and science courses—the courses likely to prepare the students for the challenges of an increasingly technological and information-oriented job market. Most differences were substantial: migrants were over twice as likely to have taken trigonometry (34 to 16 percent), physics (30 to 14 percent), and chemistry (53 to 24 percent). Migrants were over *three times* as likely as nonmigrants to have taken calculus (14 to 4 percent).

Table 10 shows the percentage of rural seniors who were ever enrolled in remedial or advanced courses or programs in English and mathematics. The results indicate that eventual migrants were more likely than nonmigrants to have enrolled in advanced English and mathematics programs: 30 percent of future nonmetropolitan migrants, for example, enrolled in an advanced mathematics program, compared with 17 percent of nonmigrants. Rural nonmigrants were more likely than migrants to have enrolled in remedial programs.

TABLE 9. Mathematics and Science Courses Taken by 1980 Nonmetropolitan Seniors

Course	All nonmetropolitan seniors	Migrants	Nonmigrants
Algebra I	78%	87%	72%
(Weighted N, in thousands)	(939)	(371)	(552)
Algebra II	46%	60%	35%
(Weighted N, in thousands)	(908)	(362)	(531)
Geometry	51%	66%	40%
(Weighted N, in thousands)	(916)	(363)	(538)
Trigonometry	23%	34%	16%
(Weighted N, in thousands)	(877)	(345)	(517)
Calculus	8%	14%	4%
(Weighted N, in thousands)	(855)	(330)	(511)
Physics	21%	30%	14%
(Weighted N, in thousands)	(868)	(337)	(517)
Chemistry	36%	53%	24%
(Weighted N, in thousands)	(899)	(358)	(526)

NOTE: Weighted N subtotals do not sum to totals due to missing migration data.

SOURCE: High School and Beyond, 1986.

TABLE 10. 1980 Nonmetropolitan Seniors Ever Enrolled in Selected Courses or Programs

Course or program	All nonmetropolitan seniors	Migrants	Nonmigrants
Remedial English	30%	24%	34%
(Weighted N, in thousands)	(928)	(370)	(544)
Remedial mathematics	29%	20%	35%
(Weighted N, in thousands)	(926)	(370)	(541)
Advanced English	24%	29%	20%
(Weighted N, in thousands)	(926)	(371)	(541)
Advanced mathematics	23%	30%	17%
(Weighted N, in thousands)	(922)	(370)	(537)

NOTE: Weighted N subtotals do not sum to total due to missing migration data.

SOURCE: High School and Beyond, 1986.

Test Scores

The HS&B datafile has two measures that can serve as early indicators of the academic preparation rural high school seniors received and of their prospects for future success in the working world. First, it shows whether a student has taken the Scholastic Aptitude Test (SAT) or the American College Test (ACT)—the two major standardized tests used as part of the college admission process. Second, the file contains mean scores on a series of timed tests measuring cognitive abilities.

Since most colleges require either SAT or ACT scores for admission, students taking either test are in a better position to go on to college immediately after high school. Under that assumption, nonmetropolitan seniors who eventually migrated fared better on this measure than those who stayed behind. Rural seniors who had moved away by 1986 were more likely to have taken the SAT or ACT than nonmigrants—73 to 45 percent.

Table 11 shows the formula scores on a battery of cognitive tests administered by the NCES and the University of Chicago's National Opinion Research Center. The cognitive tests measured the development of mental skills important for post-secondary education and success in higher level jobs. Rural migrants had scored better on each test than nonmigrants. Mean formula scores of nonmigrants ranged from 72 (on vocabulary) to 90 percent (on picture number) of migrants' scores. These results suggest that rural seniors who eventually moved far from their home communities had been better prepared than their counterparts who stayed nearby to take advantage of those opportunities leading to a successful transition to adulthood—

TABLE 11. Mean Scores for 1980 Nonmetropolitan Seniors on Cognitive Tests[a]

Selected cognitive test	All nonmetropolitan seniors	Migrants	Nonmigrants	Nonmigrant as % of migrant
Vocabulary (maximum score: 27)	9.6	11.5	8.3	72
Reading (maximum score: 20)	8.6	10.3	7.5	73
Mathematics (maximum score: 32)	15.0	17.9	13.1	73
Picture number (maximum score: 15)	11.1	11.8	10.7	90
Mosaic comparisons (maximum score: 89)	43.0	46.1	40.9	88
Visualization in 3-D (maximum score: 16)	5.5	6.3	5.0	79

a Scoring for each test was done through use of a formula equal to the number of correct answers subtracted by a fraction of the number of incorrect answers. Items not attempted did not count either way toward the final score.

NOTES: The tests were as follows: vocabulary–students matched synonyms; reading–students answered questions on short passages; mathematics–students determined the difference between two quantities; picture number–students recalled associations of numbers with pictures of familiar things; mosaic comparisons–students detected small differences between pairs of otherwise identical patterns; and three-dimensional visualization–students visualized the shape that a flat piece of metal (represented by a line drawing) would assume when folded along specified lines.

SOURCE: High School and Beyond, 1986.

opportunities that, in the 1980s, lay outside their hometowns.

The above results imply that rural seniors who had migrated by 1986 seem to have been in a better position than those who stayed behind to face the challenges of this technological age. Their preparation, illustrated by parents' education, high school experiences, and test scores, seems to have helped continue these advantages six years later. But the advantages accumulated by their senior year of high school do not completely explain why migrants had more education, higher incomes, and higher occupational status than nonmigrants. Contextual factors also contributed to the relative migrant/nonmigrant situation found in 1986.

WHAT PROMPTED RURAL SENIORS TO LEAVE THEIR HOMETOWNS?

Regression analysis was used to estimate the net effects of contextual variables on the likelihood of leaving one's hometown after high school. Migration probabilities were estimated from actual migration histories reporting whether or not the senior migrated at least 50 miles from the home community by the sixth year after high-school graduation. The dependent variable was assigned a value of 0 if the senior had not moved and a value of 1 if s/he had moved. The model is specified as follows (Hosmer and Lemeshow 1989):

$$L(X) = \exp (B_0 + B_1X) / 1 + \exp (B_0 + B_1X)$$

where, L(X) is average outcome for an individual characterized by a vector of covariates X, and B_0 and B_1 are parameters to be estimated.

Roughly speaking, L(X) is the probability of migration by an individual with a given set of characteristics. It is easier, however, to interpret the logistic regression in terms of the odds that an individual with characteristic X will migrate rather than stay. Of particular importance for the purposes of interpretation is the odds ratio, which is the ratio of the odds for two different values of X. Logistic coefficients have a ready interpretation in terms of the odds ratio: they are the log of the odds ratio for a unit change in X. Although the results of estimation can therefore generally be phrased in terms of the effects of changes in X on the log-odds, researchers generally find it more convenient to focus on the *antilog* of the coefficients, or antilog (exp B_1), which is the associated odds ratio.

To facilitate interpretation, we will therefore present all of the logistic regression coefficients in this study as odds ratios. With respect to the continuous independent variables, an estimated odds ratio that is greater than 1 implies that an individual is more likely to migrate as the value of X increases, excluding all other effects in the model. Similarly, an estimated odds ratio less than 1 implies that an individual is less likely to migrate as the value of X increases. Dummy variables receive a related interpretation, as all dummy variable coefficients are expressed in terms of the odds of migrating relative to their respective reference categories (that is, the categories not included in the model). An odds ratio greater than one means that after controling for all other variables in the model, an individual possessing characteristic X is more likely to migrate than if s/he possesses the reference category characteristic. Likewise, an odds ratio less than one means that an individual is less likely to migrate if s/he possesses characteristic X rather than the reference category trait.

Likelihood of Migrating

Box 1 summarizes the measures used in the regression analyses. Table 12 shows the results of the logistic regression analyses. In the table, Model 1

Box 1. Independent Variables

Gender
Coded as a dummy variable that takes a value of 1 if the respondent is male and 0 if the respondent is female.

Race
Coded as a dummy variable that takes a value of 1 if the respondent is nonwhite and 0 if the respondent is white.

Program type
Coded as a set of three dummy variables: General Program, Academic Program, and Vocational Program. Each dummy variable takes a value of 1 if the related program type is that of the respondent and 0 otherwise.

Post-secondary
Coded as a dummy variable that takes a value of 1 if the respondent attended a post-secondary school between 1980 and 1986 and a value of 0 otherwise.

Region
Coded as a set of four dummy variables: South, Northeast, Midwest, and West. Each variable takes a value of 1 if the respondent lived in the corresponding region in 1980 and a value of 0 otherwise.

Employment growth
Coded as a continuous variable: percentage increase in county-level employment between 1980 and 1982.

Average unemployment
Coded as a continuous variable: the average of the 1980, 1981, and 1982 county unemployment rates.

Per capita income
Coded as a continuous variable: county-level per capita personal income in 1980.

Senior class size
Coded as a continuous variable: total 12th grade membership in 1980.

High school expenditure
Coded as a continuous variable: total per-pupil high school expenditures (except capital outlay and debt service) in 1980.

Miles to nearest 4-year college
Coded as a continuous variable: approximate number of miles between the respondent's high school and the nearest four-year college.

Number of college representatives
Coded as an ordinal scale variable: 1 if no colleges sent a representative to talk to students, 2 if 1 or 2 colleges sent representatives, 3 if 3 to 5 colleges sent representatives, 4 if 6 to 10 colleges sent representatives, 5 if 11 to 20 colleges sent representatives, and 6 if 21 or more colleges sent representatives.

TABLE 12. Logistic Regression Models Predicting Migration Out of Hometown, 1980 Nonmetropolitan High School Seniors

	Estimated odds ratios (exp b)	
Variables	Model 1	Model 2
Intercept	0.384***	0.392*
Individual-level variables		
Gender (female)	1.022	0.958
Race (white)	1.033	1.074
Program type (general)		
Academic program	1.880***	2.311***
Vocational program	0.667**	0.751*
Post-secondary (no)	2.093***	2.154***
Aggregate-level variables		
Region (South)		
Northeast		0.972
Midwest		1.956***
West		1.690**
Employment growth		1.005
Average unemployment		0.992
Per capita income (000s)		0.855***
Senior class size		1.000
High school expenditure (000s)		1.171*
Miles to 4-year college (00s)		1.581**
Number of college reps.		1.059
Model Chi-square	106.40***	150.53***
Degrees of freedom	5	15
R	0.24	0.27
N	1,184	

* The probability of chance occurrence is less than .1.
** The probability of chance occurrence is less than .05.
*** The probability of chance occurrence is less than .01.

NOTE: For dummy variables, reference categories are in parentheses next to variable name.

SOURCE: High School and Beyond, 1986.

includes only the individual-level variables while Model 2 represents the full model, which contains both individual-level and community-level variables.

A comparison of Model 1 with Model 2 shows that the contextual variables make a statistically significant contribution to the fit of our model to the data (Chi-square = 150.53 - 106.40 = 44.13; df = 15 - 5 = 10; $p < .05$). Nevertheless, the rise in R from .24 to .27 indicates that the improvement in

explanatory power gained by introducing contextual variables into the analysis is modest.[5]

Because the full model fits the data significantly better than the strictly individual-level model, discussion of the coefficients is limited to the data in Model 2. Neither gender nor race had a significant effect on the likelihood of migrating out of rural areas after high school. Instead, both the type of high school program that the senior followed and whether the student attended a post-secondary institution were related to the probability of migrating out of the hometown. For instance, the estimated odds of migrating were 2.3 times higher for a high school senior who had participated in an academic program than for a senior who was in a general program. And participation in a vocational program in high school, rather than a general program, lowered the odds of migrating by .75. As for the post-secondary variable, the odds of migrating for a senior who went on to some form of formal education after high school were 2.15 times the odds for a senior who did not.

In terms of community or contextual variables, the likelihood of moving out of one's hometown was higher in both the Midwest and the West than it was in the South. The odds of migrating for seniors living in either the West or the Midwest were almost twice the odds for seniors living in the South after controlling for all other variables in the model. The results also indicate that seniors living in the Northeast were no more likely to migrate out of their hometowns than were seniors in the South.

As per capita income increases, the odds of moving decrease. Each $1,000 increase in the per capita income of the county in which a senior lived in 1980 lowered their odds of migrating by .855. For example, seniors in a county where per capita income was $13,000 were only .855 times as likely to move as seniors in a county where the per capita income was $12,000. To the extent that per capita income reflects average earnings potential in the senior's hometown, this result suggests that, excluding all the other variables in the model, an increase in the average earnings potential in the senior's hometown decreased his/her likelihood of migrating after high school. Contrary to our expectations, however, neither employment growth nor average unemployment at the county level were significant indicators of the probability of migration. Taken together, these results imply that the migration of rural youth out of their hometowns is motivated less by the lack of job availability than by inadequate potential earnings.

The results also show that an increase in per pupil high school expenditures slightly increased the odds of migrating by a factor of 1.17. To the extent that per pupil high school expenditures reflect the quality of education provided, a relatively high expenditure may have the effect of better preparing students to succeed both academically and in terms of employment. Therefore, this may explain why students attending such schools were more likely to migrate out of rural areas.

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[5] In logistic regression, R is analogous to the adjusted R-square of least squares regression (Harrell 1986).

Finally, our model suggests that the greater the distance between the senior's high school and the nearest four-year college, the greater the probability that the senior left the hometown, controlling for the effect of all other variables in the model. The odds of migrating increased by a factor of 1.58 per 100 miles of distance between the high school and the nearest four-year college.

The results of our model illustrate the importance of both individual- and community-level factors in the decision to migrate. Personal factors like the type of high school curriculum taken and post-secondary education affected the probability of moving from one's hometown. But factors such as per capita income and proximity to a four-year college—factors illustrative of the level of opportunity available in rural areas—also affected rural youth who migrated in the 1980s.

CONCLUSIONS

The data in this paper offer evidence of the presence of selective migration among young rural adults in the 1980s. Seniors at rural high schools in 1980 who had migrated from their home communities six years later had more education, higher incomes, and were more likely to be in professional and managerial jobs than those seniors who stayed behind. These advantages seen in 1986 seem to have been built upon the advantages that the migrants enjoyed in their senior year in high school.

Both individual and community factors influenced the likelihood of rural out-migration during the early and mid-1980s. Rural youth were likely to leave their home communities if they had been enrolled in an academic program in high school and had attended a post-secondary institution. Young people in the nonmetropolitan Midwest and West were more likely to migrate than their counterparts in the South and Northeast. Rural communities often lost young people if the local per capita income was low, or if the nearest four-year college was distant. Both of these phenomena probably reflected young people's search for opportunity. Interestingly, communities spending money on education (that is, having high per pupil expenditures) were also likely to lose their youth, although this was possibly because the school system ended up preparing students to take advantage of opportunities elsewhere.

In terms of analyzing what caused rural youth to leave their hometowns in the 1980s, some mysteries remain. The factors in the logistic model influenced rural out-migration after keeping all other factors constant, but community and economic factors seldom work in such a vacuum. A young person's enrollment in an academic curriculum in high school, for instance, may influence whether s/he decides to further his/her education after high school. Similarly, the influence of such contextual factors as per capita income may nullify any regional effects.

In addition, the influence of several community factors were not addressed here, largely because the HS&B contextual datafile contained no indicators for them. However, these factors merit consideration because of

links in the past to rural population change. Such factors as the size and proximity to a metropolitan county, percent employed in agriculture, and the presence of an interstate highway, have historically been important enough factors to warrant further study. Fuguitt, Brown and Beale (1989), for example, tested several factors thought to affect growth patterns in nonmetropolitan counties. Two economically-based factors, percent employed in manufacturing and expected number of hotels (the latter an indicator of a county's economic reliance on recreation), were strongly associated with rural population change in the early 1980s.

In any case, migration selection among nonmetropolitan youth was present in the 1980s, and the extent to which it continues will affect both the community of origin and the community of destination. Out-migration of workers taking advantage of economic opportunities at places of destination usually causes a decline in wages, productivity, and other economic indicators at the community of origin (Berliner 1977). Under that assumption, we could expect the out-migration of rural youth to exacerbate the economic situation in nonmetropolitan areas, contributing a disturbing cycle of economic stress. The economic crisis with which rural areas have had to endure in the 1980s have caused the migration of well-educated rural youthÄthe same young people needed to revitalize ailing rural economies.

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